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Frequency Distribution of Prostatic Lesions in Males at Gadarif Advanced Medical Diagnostic Centre, Gadarif State Eastern Sudan

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ABSTRACT

The prostate gland is a male reproductive organ, mostly affected by diseases. Prostate cancer is the most diagnosed cancer among men and causes mortality and morbidity in elderly males. The present study was carried out to determine the pattern of prostatic lesions in male patients at Gadarif Advanced Medical Diagnostic Centre, Gadarif State, Eastern Sudan from October 2017 to September 2019. For this retrospective descriptive investigation, the analysis of histopathological records of 167 cases of prostate lesions showed the mean age of 71±9.6 years; most of the patients being in the age group 61-70 years represented 67(40.1%) cases. The most common patterns of the prostatic lesions were benign prostatic hyperplasia accounted for 124 (74%) cases, 85(68.5 %) of them having chronic prostatitis on top of the benign prostatic hyperplasia, the second pattern was adenocarcinoma which accounted for 42 cases. 32(19.2) malignant cases showed PSA levels >24 ng/ml, which revealed strong correlation between the increase in PSA levels and malignant lesions (p= 0.000). The most frequent Gleason scores were 7 and 9 and Gleason's grade 3 was the most common histologic grade found in 16 (41%) cases. The present study revealed that benign prostatic hyperplasia was the most common lesion followed by adenocarcinoma and increased in elderly males. A strong correlation between increasing PSA levels and adenocarcinoma was established.

Keywords: Prostatic gland, histopathology, benign prostatic hyperplasia, adenocarcinoma, PSA

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INTRODUCTION

The prostate gland is the largest retroperitoneal accessory organ of the male reproductive system and its secretions forming about 30- 50% of the seminal fluid volume and weighing up to 20 grams (Sujatha et al., 2019). Prostatic parenchyma can be divided into anatomical and biological zones: peripheral, central and transitional zone (Anunobi et al., 2011; Epstein and Lotan, 2014). Prostatic hyperplasia lesions are common in the transition zone whereas, the peripheral zone is the main site for carcinomas (Epstein and Lotan, 2014). According to its strategic location at the bladder neck and urethra, urinary obstruction is one of the major and most common symptoms in lesions related to it (Epstein, 2004).

Important lesions of the prostate include inflammatory lesions (prostatitis), benign prostatic hyperplasia (BPH) and carcinoma. Prostate is one of the commonly affected organs of the reproductive system in elderly

males and the incidence of prostatic diseases increases with age (Shirish et al., 2013). BPH is a very common disease in men over the age of 50 years which accounts for about 20% at the age of 40 years and increases to 70% - 90% at the age 60 to 80 years respectively (Epstein, 2010). Benign enlargement of the prostate gland is reported to be the most common in blacks, Caucasians, and Jews, but less frequent in males from the Far East (Bal et al., 2008). In India, the frequency of benign prostatic hyperplasia was 87% (Manjit et al., 2011) while in Nigeria and Saudi Arabia it showed a lower frequency (82%) (Anjorin et al., 1998; Mansoor, 2003).

Prostate carcinoma is the second most frequently diagnosed cancer globally and the sixth leading cause of cancer death in males (Dabir et al., 2012), it accounts for 3% of all deaths in men over the age of 55 years (Scardino et al., 1992) and its incidence increases rapidly with age than any other cancer. The incidence of prostatic cancer varies with geographic location, ethnic background, and age. In the United States, African American men are at the highest risk of developing prostatic cancer with an annual incidence of 178/100,000; while in Asian Americans, this rate drops to 88.3/100, 000(Jemal et al., 2010; Jemal et al., 2011). Edwards et al. (2005) postulated that in the United States, 1 in 6 American men will develop prostate cancer over their lifespan. A study conducted in Pakistan reported 13.2% cases of prostatic Adenocarcinoma (Hameed et al., 2010) whereas, in Oman, India and Saudi Arabia there was a slightly lower incidence (10%) (George and Thomas, 2009; Manjit et al., 2011; Mansoor, 2003). The incidence of prostate cancer is said to be low in China and some parts of Asia, but Nigeria, is ranked number one, constituting 11% of all male cancers (Delongchamps et al., 2006; Ogunbiyi and Shittu, 1999). In Europe about 306,369 prostatic cancer cases are diagnosed each year, the lowest rates are found in Southern and Eastern Europe, while the highest rates are found in Scandinavia and Northern European States (Ferlay et al., 2007). Sudan Cancer Registry in 1978 documented prostate cancer ranked tenth among all men cancers diagnosed and less frequent than skin cancers and non-Hodgkin lymphoma (Mukhtar, 1978). Abuidris et al. (2010) reported that prostate cancer was the most common cancer among Sudanese male patients treated at the National Cancer Institute – Gazira University. It ranked first among cancer male patients (Hamad, 2011). Mohammed et al. (2014) revealed that prostate cancer was the most diagnosed cancer, accounting for 7.6% of all cancer types in men. Different malignant and benign prostatic lesions may have a very similar appearance; however, their management and prognosis are quite different, so the histopathological diagnosis plays a crucial role in all these conditions (Sujatha et al., 2019). Gleason's score is commonly used for histological grading of prostatic cancer (Kumar et al., 2016). The Gleason grading of prostatic carcinoma correlates with tumor aggressiveness, serum PSA levels, prognosis, and plays a positive role in the management of disease (Josephine, 2014). In Gadarif State no study has been done to observe the spectrum of prostatic disease, so the present study was conducted to evaluate the histopathological pattern of prostatic lesions in Gadarif Advanced medical diagnostic centre (GAMDC), Gadarif State, Eastern Sudan.

MATERIALS AND METHODS

A retrospective study was conducted at the department of histopathology and cytopathology; advanced medical diagnostics centre (AMDC), Gadarif State, and Eastern Sudan from October 2017 to September 2019. The histopathological records of a total of 167 patients with prostatic lesions were collected from AMDC to evaluate the histopathological pattern of prostatic lesions and correlated with the prostate-specific antigen (PSA) levels. Gleason scoring was done to classify Prostate cancers

Data analysis

Data were entered in Microsoft excel sheet and analyzed using Statistical Package for Social science (SPSS, version 20) for windows. P-value less than 0.05 was considered as statistically significant.

RESULTS

The collected 167 histopathological records of prostate lesions comprised of patients between 40 to 90 years of age with mean of 71 ±9.6 years. Most of the patients being in the age group 61-70 represent 67(40.1%) cases (Figure 1), followed by 50(29.9%) patients in the age group 71-80 years and 25(15%) patients in the age group 81-90 years.

The most common patterns of prostatic lesions were benign (Figure 2). The histological diagnosis indicated 124(74%) cases with benign prostatic hyperplasia (BPH) and 85(68.5 %) cases of them having chronic prostatitis. Correlation between the age and prostatic lesions incidences showed the majority of the BPH 51(30.5%) and 16(9.6%) prostate adenocarcinoma in the age group 61-70 years (Figure 3).

80(47.9%) cases with BPH showed prostate-specific antigen (PSA) levels 0-4 ng/ml, 32(19.2) malignant cases showed PSA levels >24 ng/ml and the rest of the cases had PSA levels ranging from 4.1 to 24 ng/ml (Figure 4). The correlations between PSA levels increases (>24ng/ml) and adenocarcinoma was found to be highly significant (*P* value=0.000).

The common Gleason's score of 7 and 9 had equal distribution; 13 (31%) followed by Gleason's score 10 found in 3 (7.1%) cases and 10(24%) cases had Gleason's score ranging from 4 to 6. Gleason's Grade 3 was the most common pattern is seen in 41% of cases

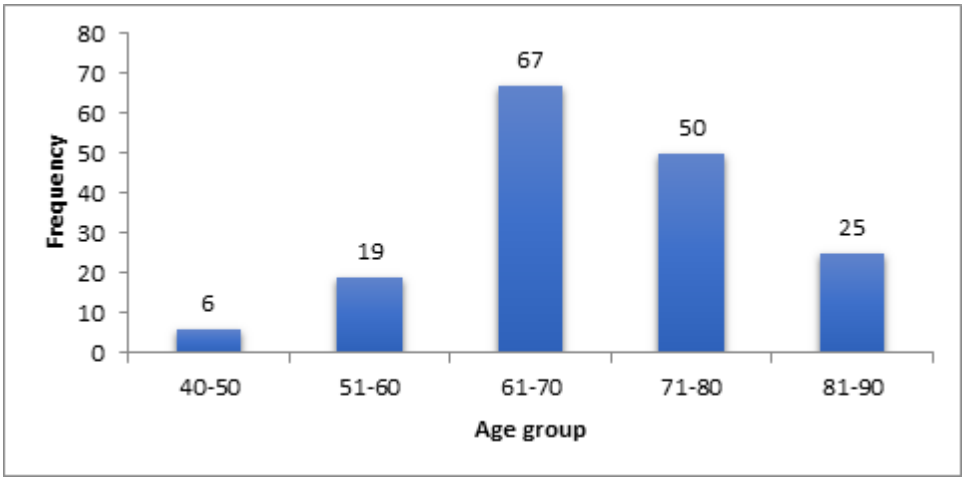

Figure 1: distribution of patients with prostatic lesions according to Age group.

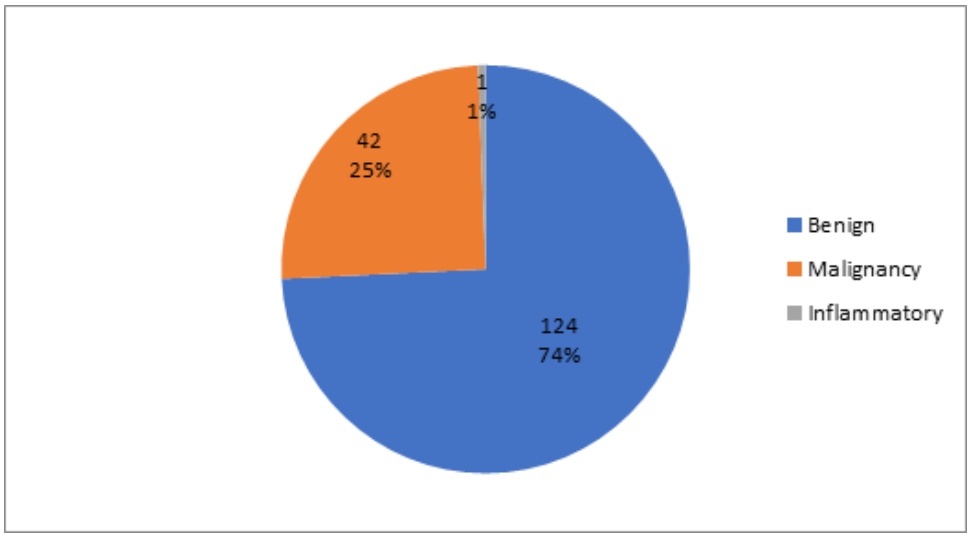

Figure 2: The distribution of patterns of prostatic lesions in the subjects study

(Table 1).

DISCUSSION

In the present study, BPH and adenocarcinoma were more prevalent in the age group of 61-80 years, this was in line with previous studies (Albasri et al., 2014; Khatib et al., 2016; Chauhan and Sarvaiya, 2017; Sujatha et al., 2019). In the current study, most common prostatic lesion was BPH followed by malignancy this is in agreement with the previous study carried out by Forae et al. (2011) who reported BPH as the first and adenocarcinoma the second most prevalent diseases. Our findings are in accordance with Kumar et al. (2019) as the presence of BPH is 74 % and 76 % respectively. However, contrarily present study shows 68.5% cases of BPH with chronic prostatitis, while other studies revealed only 28 % cases of BPH with chronic prostatitis followed by acute prostatitis (Kumar et al., 2019).

PSA is elevated by any change that destroys the normal architecture of the prostate which allows diffusion of protease into the microvascular circulation (Sujatha et al., 2019). PSA assay is an important tool in screening for prostate cancer (Javed et al., 2016). In this study, most of the benign lesions had serum PSA level ≤ 4 ng/ml and malignant lesions had more than 24 ng/ml, which was in concordance with previous studies. Khatib et al. (2016) reported that the majority of the benign lesions had prostate-specific antigen (PSA) levels < 5 ng/ml and all cases of adenocarcinoma showed prostate-specific antigen (PSA) levels > 20 ng/ml indicating a significant association of serum prostate-specific antigen (PSA) level with dysplasia in the prostate (Khatib et al., 2016). Anushree and Kusuma (2012) also observed that in benign lesions serum PSA was normal in 55% of cases

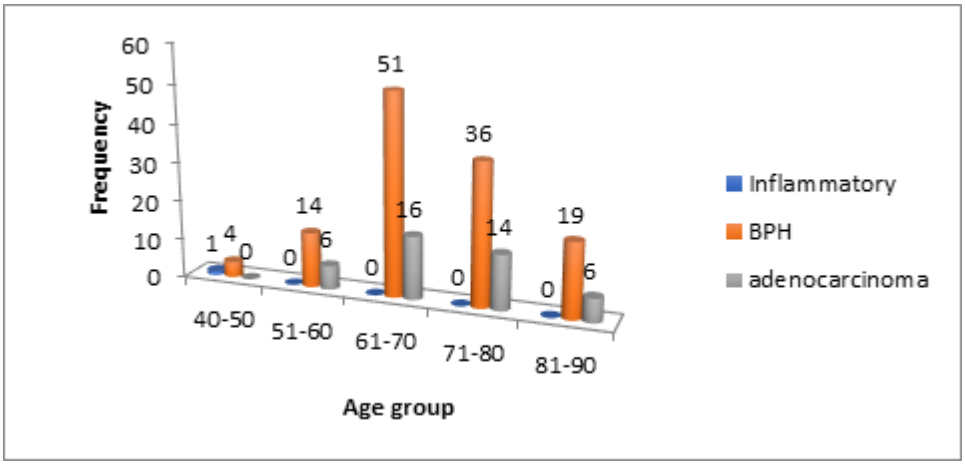

Figure 3: frequency distribution of types of prostatic lesions in patient's age group.

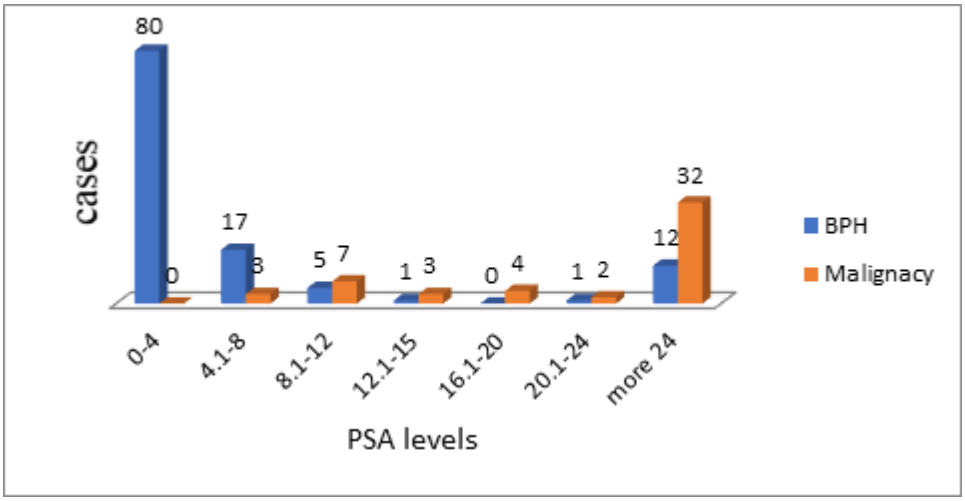

Figure 4: distribution of PSA level in the cases with prostatic lesions

Table 1. Histologic Grade according to Gleason Score.

Gleason Score	histologic Grade	No. of Cases	Percentage (%)
≤ 5	I	8	20.5
6 - 7	II	15	38.5
8 - 10	III	16	41
Total		39	100

and malignant lesions showed an elevation in serum PSA levels (>20ng/ml). Adenocarcinomas were graded according to the Gleason grading system (Humphrey et al., 2016). In the present study, the most frequent Gleason's score were 7 and 9 each one found in 13 (31%) patients, this finding was consistent with the studies of Kumar et al. (2016) that reported most common Gleason's score were 7 and 9 found in 37.5% patients. Epstein (2010) reported that tumors with Gleason score 8-10 have advanced cancers with poor prognosis. Bhat et al. (2015) observed 56.16% cases of adenocarcinoma with Gleason score of 8-9. In the current study, Gleason's grade 3 was the most common histologic grade (41%), this is in agreement with previous studies (Chandanwale et al., 2013; Kumar et al., 2016; Imasogie and Azeke, 2017).

Conclusion and Recommendations

BPH was the most common lesions followed by adenocarcinoma in elderly males. A strong correlation of increasing PSA levels and adenocarcinoma was observed, Gleason's grade 3 was the most common

histologic grade in our patients. Males above 40 years of age, with urinary symptoms, are advised to screen for PSA.

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